

# frigicoll

## OPERATION MANUAL

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### Three-phase Energy Meter

DTS343-3



Thank you very much for purchasing our product. Before using your unit, please read this manual carefully and keep it for future reference.

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# 1 Overview

Model DTS343 (configuration number 3) three-phase energy meter is suitable for measurement of three-phase four-wire AC active energy. It is composed of MCU control part, electric energy metering part, liquid crystal display part and communication part, conforming to IEC 62053-21:2003 and other relevant standards for electric energy meters; it can measure the total positive active power; it has RS485 interface communication; It has prompts for Phase failure and reverse fault alarm and event recording functions; it has the characteristics of good stability, high reliability, and wide linear range.

# 2 Main performance indexes

<b>Specifications:</b>	Voltage: Three-phase four-wire: 3×220V/380V Current: 10(100) A Frequency: 50 Hz Accuracy: Level 1
<b>Conformity:</b>	IEC 62053-21:2003
<b>Working voltage range:</b>	154V—286V
<b>Starting voltage:</b>	Single phase≥176V, combined phase≥154V
<b>Operating temperature range:</b>	-25°C—60°C
<b>Limited operating temperature range:</b>	-40°C—70°C
<b>Transportation and storage temperature:</b>	-40°C—70°C
<b>Relative humidity:</b>	Less than 95%, with no condensation
<b>Frequency range:</b>	47.5Hz—52.5Hz
<b>Power consumption:</b>	Voltage circuit power consumption: ≤1.5W, 6VA/phase; Current circuit power consumption: ≤0.2VA/phase (I <sub>b</sub> <10A ), ≤0.4VA/ phase( I <sub>b</sub> ≥10A)
<b>Starting:</b>	≤2‰I <sub>n</sub> (Level 1, mutual inductance meter); ≤4‰I <sub>b</sub> (level 1, straight through meter)
<b>Anti-sneak current:</b>	No
<b>MTBF:</b>	≥10×104h

<b><i>Design life:</i></b>	15 years
<b><i>Display:</i></b>	LCD display, prompt by multiple Chinese characters
<b><i>Power supply:</i></b>	Three-phase linear power supply, which can work under single-phase, broken zero circuit or any two-phase circuit power supply.
<b><i>Data communication:</i></b>	1-way standard RS485; protocol conforms to DL/T645 (with extension)
<b><i>Test the output of the photoelectric head:</i></b>	The pulse width is $80\pm 20$ ms.
<b><i>Power pulse output:</i></b>	Optocoupler C and E pole output; In the case of pure resistive load, the maximum withstand voltage: $V_{CEO}=35V$ , $V_{ECO}=6V$ , and the maximum current: 10mA.

### 3 Main function

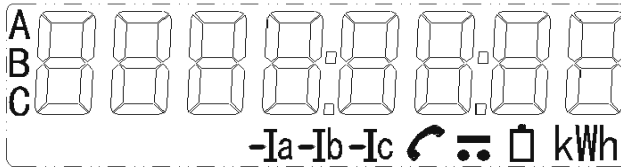
#### 3.1 Metering function

The meter can measure the positive active power.


The current electricity data can be read through the RS485 communication port.


#### 3.2 Display


##### 3.2.1 LCD display



##### 3.2.2 LCD display description

: The meter does not display when it is normal, and it indicates that the internal battery is low when it displays. Under normal situation, this indicator will not light up. It indicates that the internal battery is low.

: When this indicator flashes, it means that the meter has received the correct communication command frame (flashing for 10 seconds).

: When it displays, it means that the internal programming jumper is short-circuited. It indicates that the internal programming jumper has got short circuited

**ABC**: Means phases A, B, and C respectively.

**-Ia**: The meter does not display when it is normal, flash display indicates that the A-phase phase current is reverse.

**-Ib**: The meter does not display when it is normal, flash display indicates that the B-phase phase current is reverse.

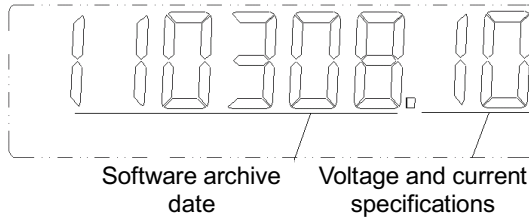
**-Ic**: The meter does not display when it is normal, flash display indicates that the C-phase phase current is reverse.

Meter number: Meter communication address.

##### 3.2.3 Display

The factory default only displays the current total active power.

### 3.2.4 Display frames of power-on version number



### 3.2.5 Power failure status display

In the power-off state, the meter often displays the current total power.

## 3.3 Description of indicator light

Meter indicator lights are from left to right: active pulse indicator light, phase A failure alarm indicator, phase B failure alarm indicator, and phase C failure alarm indicator.

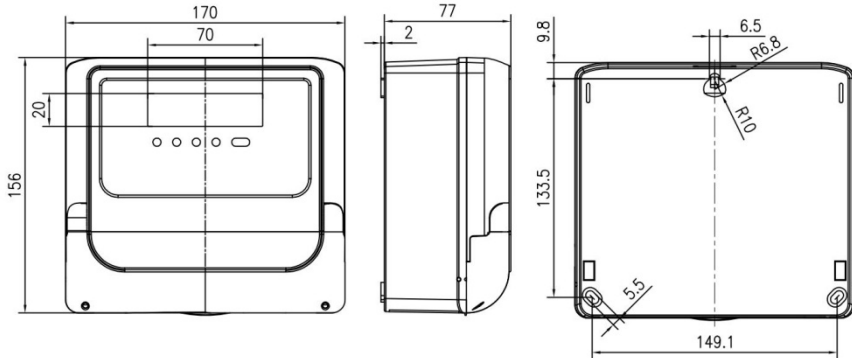
When a phase failure event occurs, the alarm indicator corresponding to the phase lights up. When a reverse phase sequence event occurs, the alarm indicators of phases A, B, and C flash at the same time.

## 3.4 Communication function

The meter has RS485 communication. When the distance is greater than 50 meters, a 120-ohm matched resistance must be connected in parallel between the signal circuits at both ends of the RS-485 bus to ensure the stability of the RS-485 bus. The specification model of matched resistance is RJ-1/4W-120Ω±1%100ppm/°C (the article number is R1212400).

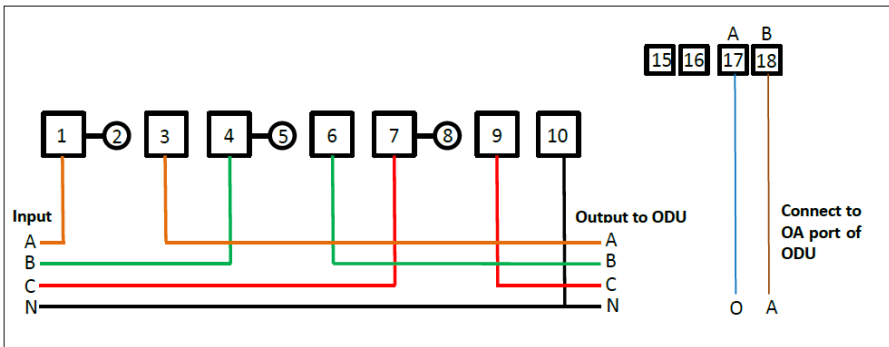
## 4 Installation and Wiring

(1) The appearance and installation dimensions of the electric energy meter are shown in the figure below:



(2) A schematic diagram of the main terminal wiring shown below is attached inside the end cover of the electric energy meter, the inlet and outlet direction of the main terminal wiring shall not be connected reversely.

Note: When the meter leaves the factory, the port AB that is No. 17 and No. 18 comes with a 120-ohm resistor. Please keep it when connecting to the OA communication line.



## **5 Transportation and Storage**

1) This product shall be transported under packaging conditions. It shall not be subjected to severe vibration and shock during the transportation and unpacking process. Its transportation, packaging and storage shall meet the requirements of GB/T13384-2008 "General Specifications for Packaging of Mechanical and Electrical Products"

2) The electric energy meter shall be stored in the original packaging. The environment of the storage place shall be clean with the ambient temperature in the range  $-20^{\circ}\text{C}\sim+65^{\circ}\text{C}$ , the relative humidity not exceeding 85%, and the corrosive gases and molds shall not be contained in the air.

3) If the product is stored in the warehouse, it shall be placed on the shelf under the original packaging condition, and their stacking height shall not exceed 5 layers.

4) The product with the inner packaging unpacked shall not be stored.

## **6 Precautions**

1) There are no user adjustable components inside this product.

2) Before leaving the factory, this product has been inspected as qualified and has been sealed with lead seal. When installing and using, just connect the wiring according to the wiring diagram inside the cover after removing the terminal cover. After wiring, the terminal shall be sealed with lead seal, and the door of the electric energy meter shall be sealed with lead seal.

3) The cross-sectional area of the wire connected to the electric energy meter shall meet the load current requirements to avoid damage of the electric energy meter due to poor contact or too thin.

4) When installing and using, the wiring must be connected and tightened. The incoming and outgoing wires from the power supply cannot be reversed.

5) The electric energy meter shall be installed in a ventilated and dry place, and the bottom plate of the electric energy meter shall be fixed on a solid fire-resistant and vibration-resistant wall. The electric energy meter shall be installed vertically, and the recommended installation height is 1.8 meters.

6) The working environment of the electric energy meter shall have lightning protection measures.



## **7 Disposal of energy meter**

### **1) Disposal of the entire electric meter**

When disposing off the electric meter, it shall be noted that the meter contains hazardous waste such as liquid crystal displays, light-emitting diodes, and batteries. It must be recycled or destroyed by relevant qualified institutions in accordance with local laws or regulations.

### **2) Disposal of components**

According to the requirements of the ISO 14001 environmental management system, the electric meters shall be classified and disposed off according to recyclable waste, non-recyclable waste, and hazardous wastes such as classification and disposing off the following devices: ① Hazardous (dangerous) waste: liquid crystal display (LCD) and light-emitting diode (LED), batteries, printed- circuit boards, etc.; ② recyclable waste: metal parts, housing, plastic parts, etc. It must be recycled or destroyed by the relevant qualified organization in accordance with the current local waste disposal and environmental protection regulations.

## Safety Instructions

1. For the installation and removal of the instrument connected through the junction box, the junction box shall be used to ensure that the power grid is isolated and operated by personnel with relevant safety qualifications; for the installation and removal of the instrument not connected with the junction box, the Operation shall be conducted by personnel with relevant safety qualifications, while preventing electric shock and short-circuit between phases.
2. After removing the end cap or upper cover of the instrument in the laboratory, if it is powered on, its terminals or conductors will carry dangerous voltage. Therefore, the user is not allowed to carry out the live operation of removing the upper cover; if the user needs to perform the live operation after removing the end cover, the protective barriers or measures shall be provided and the operation shall be performed by skilled and safety-qualified personnel.
3. During the installation of the instrument, the cable type, cross-sectional area size, and joint requirements that meet the requirements of the relevant electrical specifications shall be used, and the corresponding torque for tightening the screws shall be used.
4. When replacing the battery of the meter, the same specification battery as the original battery of the meter shall be used, and the polarity of the battery shall be installed correctly.
5. The following circuits of the instrument are circuits with dangerous voltages, and must be protected in accordance with relevant safety regulations during on-site operation:
  - Voltage circuit directly connected with the instrument;
  - Zero circuit;
  - Current return directly connected with the instrument;
  - Relay/control switch and voltage circuit for alarm output;
  - Auxiliary power circuit connected to the power circuit;



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